

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Bonne Femme Creek

Water Body Segment at a Glance:

| | |
|------------------------------------|----------------------------------|
| County: | Boone |
| Nearby Cities: | Between Columbia and Ashland |
| Length of impaired segment: | 7.0 miles |
| Pollutant: | Bacteria |
| Source: | Urban and Rural Nonpoint Sources |
| Water Body ID: | 0750 |



Scheduled for TMDL development: 2011

Description of the Problem

Beneficial uses of Bonne Femme Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category A

Use that is impaired

- Whole Body Contact Recreation – Category A

Standards that apply

- Missouri's Water Quality Standards at 10 CSR 20-7.031(4)(C) state that the *E. coli* bacteria count shall not exceed 126 colonies per 100 milliliters of water (126 col/100 mL) for Category A and 206 col/100 mL for Category B waters. This count is the geometric mean during the recreational season (April 1- October 31) in waters designated for whole body contact recreation.

Background information and water quality data

Bonne Femme Creek is a tributary to the Missouri River in southern Boone County. There are no towns in the watershed, but several subdivisions have small wastewater treatment plants that could contribute to occasional high levels of bacteria in the creek. Since the data are insufficient to pinpoint sources of contamination, nonpoint sources (general runoff from rain events) are

implicated. Bonne Femme Creek is designated as Category A for the whole body contact recreation use, which means it has swimming areas which are open to and fully accessible by the public.

Excessive amounts of fecal bacteria in surface water used for recreation are an indication of an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat and skin diseases. Like fecal coliform, *Escherichia coli*, or *E. coli*, are bacteria found in the intestines of warm blooded animals and used as indicators of the risk of waterborne disease from pathogenic (disease causing) bacteria or viruses. Most *E. coli* strains are harmless, but some can cause serious illness in humans and are occasionally responsible for product recalls. The harmless strains are part of the normal flora of the intestines, and can benefit their hosts by preventing the establishment of pathogenic bacteria within the intestine^{1,2}. Missouri's bacteria criteria are based on specific levels of risk of acute gastrointestinal illness. The levels of risk correlating to these criteria are no more than eight illnesses per 1,000 swimmers in fresh water.

The impairment for Bonne Femme Creek is based on data collected by the department, which collected nine samples between in 2004 and 2005. The geometric mean for 2004 exceeds the water quality criterion of 126 col/100 mL for Category A waters.

***E. Coli* data for Bonne Femme Creek at Nashville Church Rd (Site #2 in map below)**

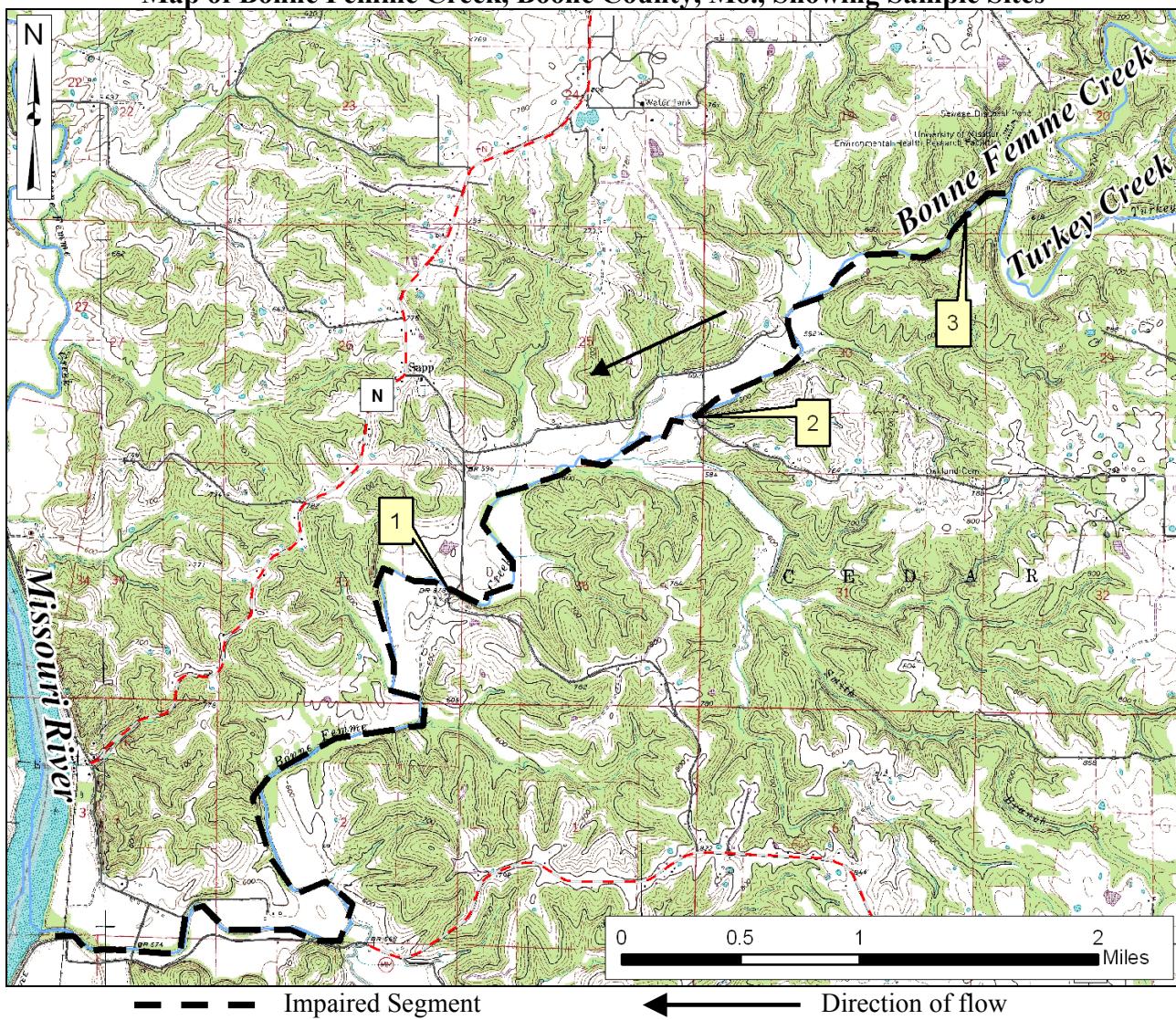
| Sample Date | E. coli | Recreational Season E. coli |
|------------------------|---------|-----------------------------|
| 7/28/2004 | 401 | 401 |
| 8/18/2004 | 59 | 59 |
| 820/04 | 1000 | 1000 |
| 9/9/2004 | 110 | 110 |
| 9/16/2004 | 80 | 80 |
| 9/29/2004 | 50 | 50 |
| 11/9/2004 | 170 | |
| 12/15/2004 | 98 | |
| Geometric Mean: | | 148 |

People can protect themselves from waterborne illness by avoiding contact with contaminated water. However, when swimming anywhere, it is wise to take commonsense precautions. These include washing hands before eating, showering after swimming and avoiding exposure to questionable water if you have open cuts or wounds.

¹ Hudault S, Guignot J, Servin AL (July 2001). "[Escherichia coli](#) strains colonising the gastrointestinal tract protect germfree mice against *Salmonella typhimurium* infection". *Gut* **49** (1): 47–55

² Reid G, Howard J, Gan BS (September 2001). "Can bacterial interference prevent infection?". *Trends Microbiol.* **9** (9): 424–8.

Map of Bonne Femme Creek, Boone County, Mo., Showing Sample Sites



Sample Sites

- 1 – Bonne Femme Cr. at Sapp Rd.
- 2 – Bonne Femme Cr. at Nashville Church Road
- 3 – Bonne Femme Cr. near mouth

For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

P.O. Box 176, Jefferson City, MO 65102-0176

1-800-361-4827 or 573-751-1300 office or 573-522-9920 fax

Program Home Page: www.dnr.mo.gov/env/wpp/index.html